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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bernd Bartenbach

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EXAMINER

BOYER, RANDY

ART UNIT

PAPER NUMBER

1797

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/806,191	<b>Applicant(s)</b> BARTENBACH ET AL.	
	<b>Examiner</b> RANDY BOYER	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7, 19, 20, 22-25 and 27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 19, 20, 22-25 and 27 is/are rejected.
- 7) ☒ Claim(s) 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Examiner acknowledges Applicant's response filed 4 November 2009 containing amendments to the claims and remarks.
2. Claims 1-7, 19, 20, 22-25, and 27 are pending.
3. The previous rejections of claims 1-7, 20, 22-25, and 27 under 35 U.S.C. 103(a) are maintained. Likewise, a new grounds for rejection of claim 19, necessitated by Applicant's amendment to the claims, is entered under 35 U.S.C. 103(a). Finally, objection is entered with respect to claim 19. The objection and rejections follow.

### ***Claim Objections***

4. Claim 19 is objected to for making reference to a canceled claim (claim 11). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-7, 19, 20, 22-25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Passler (US 5,789,644) in view of Stapf (US 6,365,792).

9. With respect to claims 1, 20, and 27, Passler discloses a process for producing acetylene by partial oxidation of hydrocarbons using oxygen (see Passler, column 1, lines 4-6), in a reactor comprising a reaction chamber and a quench area (see Passler, column 2, lines 25-39), in which starting materials are supplied to the reaction chamber through channels of a burner block (see Passler, column 2, lines 29-33), where in the reaction chamber the high-temperature reaction having a short residence time (e.g.,

from 1 to 100 ms) (see Passler, column 1, lines 26-30) takes place at a temperature of at least 1500°C (see Passler, column 1, lines 30-32) and the reaction mixture is subsequently rapidly cooled in the quench area (see Passler, column 1, lines 32-33), characterized in that in the quench area a direct cooling to a temperature below about 300°C takes place by supply of an evaporating medium (see Passler, column 1, lines 33-35).

Passler does not explicitly disclose wherein the process further comprises a subsequent *indirect* cooling in a heat exchanger of the quench area.

However, in an improvement to Passler's process, Stapf discloses a two-stage cooling in the quench area of the reactor - a direct quenching (pre-quenching) to a temperature of at most 1000°C (see Stapf, column 4, lines 40-43) followed by indirect cooling with a heat exchanger to a temperature below about 300°C (see Stapf, column 4, lines 40-43; column 5, lines 37-42; and column 6, lines 5-9). Stapf explains that operating the partial oxidation with such a two-stage quenching operation provides for a more economical process, for example, by using the heated coolant from the heat exchanger to pre-heat the feedstock (see Stapf, column 5, lines 37-40).

Therefore, the person having ordinary skill in the art would have been motivated to modify the process of Passler to incorporate use of the two-stage quenching operation of Stapf in order to achieve a more economical process.

Finally, the person having ordinary skill in the art would have had a reasonable expectation of success in modifying the process of Passler as described above because: (1) both Passler and Stapf are directed to processes for the preparation of

acetylene via partial oxidation of hydrocarbons using oxygen; and (2) Stapf explicitly describes his process as an improvement over that of Passler.

10. With respect to claim 2, Stapf discloses wherein the starting materials starting materials may be premixed (see Stapf, column 2, lines 36-37).

11. With respect to claims 3, 22, and 23, Stapf discloses wherein the direct cooling takes place at a temperature of at most 1000°C (see Stapf, column 4, lines 40-43).

12. With respect to claim 4, Stapf discloses wherein there is at least one stage of direct cooling (see Stapf, column 4, lines 40-43).

13. With respect to claim 5, Stapf discloses wherein the quench medium is water or oil (see Stapf, column 3, lines 2-6).

14. With respect to claims 6 and 7, Stapf discloses wherein the indirect cooling takes place to less than 300°C (see Stapf, column 6, lines 7-9); and wherein steam may be generated (see Stapf, column 6, lines 9-10).

15. With respect to claim 24, Stapf discloses wherein the quench medium may be water (see Stapf, column 3, lines 2-6) and wherein the direct cooling lowers the reaction temperature to some point between 100°C and 1000°C (see Stapf, column 3, lines 2-6; and column 4, lines 40-43) – i.e. above the boiling point of water, thereby expecting a “complete evaporation” of the quench medium.

16. With respect to claim 25, Stapf makes reference to the process of Passler (see Stapf, column 3, lines 8-9) which Examiner submits is an example of the Sachsse-Bartholomé process for acetylene production. In this regard, Applicant admits that such

process produces an acetylene yield of about 29% based on carbon (see Applicant's specification, page 8, lines 23-25).

17. With respect to claim 19, Passler discloses a design range for the numbers and diameters of the channels passing through the burner block (see Passler, column 2, lines 9-14), explaining that the nominal size of the burner block and burner are determined by the number and size of the channels (see Passler, column 2, lines 9-14), thereby suggesting the possibility for scale-up of the reactor as desired.

### ***Response to Arguments***

18. Applicant's arguments filed 4 November 2009 have been fully considered but they are not persuasive.

19. Examiner understands Applicant's arguments to be:

- I. Passler does not suggest a process wherein a reaction mixture is rapidly cooled in a quench area, characterized in that in the quench area firstly a direct cooling to a temperature in the range of 650°C to 1200°C takes place by supply of an evaporating quench medium and subsequently in the quench area an indirect cooling in a heat exchanger takes place.
- II. Staph does not teach using indirect cooling in a process for carrying out a high temperature reaction at a temperature of at least 1500°C and with a short residence time.
- III. Staph teaches that it is necessary to carry out the reaction at temperatures below 1400°C to allow a cooling in two stages.
- IV. According to Staph, indirect cooling can only be employed when a comparatively long residence time is employed and the reaction is carried out at a

temperature below 1400°C. Staph teaches that if the reaction is carried out at temperatures above 1400°C, the cooling in two stages is not quick enough to achieve an acceptable yield.

- V. Both Passler and Staph teach rapid cooling in one stage is necessary if the reaction is carried out at temperatures above 1500°C.
- VI. Staph teaches that two-stage cooling can only be employed if the reaction is carried out below 1400°C.

20. With respect to Applicant's first and second arguments, such arguments are not persuasive because one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

21. With respect to Applicant's third, fourth, fifth, and sixth arguments, Staph only discloses that heavier soot formation and reduced acetylene yield would be expected at reaction temperatures greater than 1400°C (see Staph, column 3, lines 31-40). Staph does not suggest that the use of two-stage cooling would somehow be *impossible* at temperatures greater than 1400°C (see Staph, entire disclosure). Furthermore, even with the noted disadvantages for operating at higher temperatures, sufficient motivation exists for the person having ordinary skill in the art to employ the two-stage cooling of Staph in the process of Passler – e.g., (1) to provide for more effective heat recovery (see Staph, column 4, lines 32-34); and (2) to generate valuable high pressure steam that could be used in other parts of the process (see Staph, column 4, lines 34-37).



***Conclusion***

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 7:30 A.M. to 4:00 P.M. (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Randy Boyer/

Examiner, Art Unit 1797

/Glenn A Caldarola/

Acting SPE of Art Unit 1797